After a short stay at Sandy Point, a Chilian settlement at the eastern mouth of the Straits, Mr. Ball proceeded to Monte Video and Buenos Ayres, from whence he ascended the Uruguay River; and, passing Fray Bentos, the great factory of "Liebig's Extract of Beef," finally reached Paysandu, equally familiar to English housekeepers for its preserved tongues. This digression gave him a fair view of the aspect of the flora of a great extent of the Argentine Confederation, which, with its Pampas, Salinas, and riparian vegetation differs wholly from that of all the regions he had hitherto visited. For the Argentine Confederation he proposes the term "Argentaria," a good one, which will, we hope, be acceptable to biologists, and to geographers too.

Santos, in South Brazil, was the next point visited, and from there Mr. Ball took the rail to Sto. Paolo, and thence on to Rio de Janeiro. Here he is upon ground familiar to naturalists, and we need only allude to the singular speculation to which his observations on the geology of that part of Brazil, and his reading of the observations of others on the same subject, have given birth. After dwelling on the enormous area of Brazil occupied exclusively by granite and gneiss, and the extent and depth of the deposits of the disintegrated materials formed out of the same matrix, including 200,000 square miles of the plateau of Brazil, the Argentine Pampas, and Paraguay, he goes on to say: "To my mind the conclusion is irresistible that ancient Brazil was one of the greatest mountain regions of the earth, and that its summits may very probably have exceeded in height any now existing in the world." And it is these mountains which he regards as the probable birthplace of the chief types of the phanerogamous vegetation of South America. A few peculiar types, indeed, may have been developed in the Andes, but not such as have stamped their features on the vegetation of the continent. Mr. Ball further correlates this speculation with another as bold, which he gave to the Geographical Society in 1879 (Proceedings, p. 464), and which is, that the chief types of existing flowering-plants originated in the higher mountain regions of the globe "at a period when the proportion of carbonic acid gas present in the atmosphere was very much greater than it has been since the deposition of the Coal-measures." To discuss these novel ideas would be out of place here; but we must, in justice to our author's candour, add his avowal that he regards them "as having no claim to rank as more than probable conjectures, but that, as they rest on some positive basis of facts, they may be serviceable to the progress of science by stimulating inquiry."

It remains to add that the work concludes with two appendixes—one "on the fall of temperature in ascending to heights above the sea-level," which is a model of painstaking research into the methods and observations hitherto adopted, but which leaves this complex subject no further advanced; the other, "on Mr. Croll's theory of secular changes of the earth's climate," is a really valuable contribution to that fascinating inquiry. And here we take leave of Mr. Ball, congratulating him heartily on having added to our library of South American travels a volume that well deserves a corner of the shelf that contains those of Humboldt, Darwin, and Bates.

PALÆOLITHIC MAN IN NORTH-WEST MIDDLESEX

Palæolithic Man in North-West Middlesex. By J. A. Brown. (London: Macmillan and Co, 1887.)

THIS work has two faults by no means peculiar to itself, but which it shares with many books on science.

One of these is the large amount of introductory matter that bars the way to the special subject of study. Thus we do not get into Middlesex until reaching page 42, and then we quit it again after p. 120, to return at p. 185. Certainly, our author shows us how much trouble he has taken in looking up authorities on palæolithic and savage man in general; but he should remember that some folk don't like their whisky to be over-watered.

The second fault one must allude to with sorrow. Why is it that so many scientific scribes have such a weakness for slipshod English? Is it that they feel the advance of science to be so rapid that their works will be passed by in a few years, as out of date, so that it is not worth while to cultivate style, and grammar is hardly essential? Or is it that they expect the bad language of to-day to be the good language of the future, by an evil process of evolution, the survival of the unfittest? Let Prof. Lankester note this as a possible case of degeneration.

One cannot resist giving some examples. On p. 11 we are told that "abundant traces of man in the Neolithic Age are found on the surface of the ground, which may be picked up on ploughed fields." The surface of the ground is usually a good deal picked up on ploughed fields; but of course that is not what is meant. An author who has written much on prehistoric man might perhaps be justified in bringing an action for libel for the remark on p. 67 that "the fauna—as Prof. Dawkins says—is the same, and are referable to the same geological horizon." On p. 90 it is said of a certain tool that "it certainly has the appearance of greater antiquity as an implement, than do a very large proportion," &c. In the middle of p. 94 three successive sentences begin with "It," but that awkward little word in two cases stands for one particular implement, whilst in the third the general type to which that implement belongs must be referred to, as the particular "it" cannot have been found, in these unmiraculous times, in three distinct places: at Ealing, in Kent, and in Surrey. At p. 112 the singular "No. 131" is shortly followed by the plural "They," the latter being meant to refer to other numbers as well.

Having said this much as to things in general, we may say that Mr. Brown's book is a praiseworthy account of a particular district, and that it would not be amiss if other districts had as careful an observer in their midst, eager to see every section, and to record every find. It is a work that London antiquaries and geologists should possess.

Up to the time when Dr. Evans's great work on stone implements was published, but few specimens of worked flints had been recorded from the metropolitan district; but in the same year, Colonel Lane-Fox (now General Pitt-Rivers) recorded the finding of a large number in the gravels round Ealing. Notwithstanding this, however, hardly any addition was made to London implements for some years, when Mr. Worthington Smith developed the marvellous faculty of finding them in nearly every gravel-pit he went into. Our author makes a good third to these two, and that is saying a great deal. It is to be hoped that his book may lead other observers to join in the work that he has so much advanced, and to do for other parts of London and the surrounding country what he and the above-named authors have done on the north-west and north-east, and Mr. F. Spurrell on the south-east.

The antiquity of man is so controversial a subject that anyone who writes on it must expect to find more foes than friends. Mr. Brown, therefore, must not be surprised at exception being taken to some of his views, and in noticing his work one may fairly point out some matters on which opinions are likely to differ.

The remark, on p. 13, of piles (for dwellings) having been found at Moorfields received a curious illustration whilst it was in the press; for a building in that district was then being underpinned, on account of part of the pile-structure on which it was based having decayed; that building being none other than the lecture-hall of the London Institution.

The name "chalky boulder clay" was given by Mr. S. V. Wood, Jun., and not by Mr. Skertchly, as the footnote on p. 27 says.

That the brick-earths of Erith, Crayford, &c., are preglacial few geologists will be found to believe; perhaps, indeed, only Prof. Dawkins; and our author wisely throws the burden of this belief on that gentleman (p. 33).

As to the Tilbury man, alluded to on p. 42, there can be no doubt that his remains were found in a very late postglacial deposit, simply the alluvium of the Thames. Mr. T. V. Holmes has set this question at rest (Trans. Essex Soc.).

By a slip, on p. 45, hard chalk, flint, and greywethers have been classed amongst rocks that do not occur in the valley of the Thames.

Probably there are geologists who would be disposed to question the strictly glacial origin of the furrowed gravel and the bent loam carefully described on pp. 45-47. Such irregular surface-deposits are so common in districts far from undoubted glacial beds as to leave their origin doubtful.

"The large encroachments of the sea which have taken place . . . in historic times" are no proof of depression (p. 48). They are simply the result of denudation along coasts.

The term "alluvium" should be confined to the deposits of rivers and not applied generally to surface-soil, as on p. 50, in which case it becomes a useless synonym.

The peculiar black bands often seen in gravels have troubled many observers, but from finding particles of carbonised wood occasionally in them Mr. Brown is not justified in saying that "there seems to be no doubt that such black strata are due to vegetable life," especially as he recognises the fact that the *colour* (which is what he refers to) is generally due to oxide of iron or of manganese. And even were the blackness due to vegetation, it is by no means a reasonable assumption that the beds were land-surfaces (p. 54), for the vegetable remains may have been carried down by water. That the white beds occasionally seen are "probably the result of decomposition of animal or vegetable matter" is also rather doubtful, the colour (which here again is what the author refers to, though his language implies the beds themselves) being often the result simply of the washing-out of the iron-oxide, which gives the usual brown tint, by percolating water.

There may be some doubt whether, when man first invaded England, the connexion of our country with the mainland was caused "by the uprise of the bottom of what is now the . . . North Sea." The present severance need not have been brought about by depression, but perhaps is owing simply to denudation, so that there is no need to invoke uprise to account for former connexion. There is also some difficulty in the uprise in question, as Mr. Brown thinks that Middlesex, &c., "was slowly emerging from the sea," and therefore must have been at a lower level than now. It is most likely indeed that at that time the whole land was higher than now, as otherwise it would be hard to account for the greater size of the rivers, as compared with their present descendants, for higher land would give greater rainfall, and greater rainfall means stronger streams. If "man beheld the land now under the 300-foot contour in Middlesex as an arm of the sea," there could have been nothing worthy the name of river, or even of brook, in the county, and the deposition of such coarse matter as our river-gravels would be out of the question (pp. 67, 68), those gravels certainly not being marine deposits.

In the picture of a Palæolithic scene from Castlebar Hill (pp. 185, &c.), it would seem as if the author were, as is often the case with geologists, a little too much impressed with the present features of the country, so as to allow too little for the amount of denudation that has happened since the time his picture represents. Instead of water then occurring over the whole of the low clay-country to the north, is it not possible that the tract in question was much higher than now, a great sheet of clay having been gradually swept off it since? Indeed, the author distinctly recognises the great amount of denudation that has occurred south of Castlebar Hill, along the valley of the Thames (pp. 191, 192), and of course there is no possibility of the process being confined to one side of the ridge.

The conclusions of Dr. Hicks as to the Glacial or pre-Glacial age of man in North Wales, noticed at the end of the work, are not altogether accepted, and should be considered as still waiting for the verdict of geologists.

Mr. Brown is clearly a positivist, as far as worked flints are concerned, and one is tempted to speculate on his direct descent from Palæolithic ancestors, for, as if by some hereditary instinct, he is enabled to be quite positive as to the uses to which sundry implements have been put, to an extent, indeed, to which probably few of even that highly imaginative class of men, antiquaries, will follow him. Some examples of this positivism may be noticed. Thus certain flakes were "evidently intended for spear-heads" (p. 58); and certain "triangular stones . . . could hardly have been intended for use in any other way" than as arrow-heads, "they were no doubt hafted" (p. 117); but from the figures given of some of these stones one would be inclined to regard them as little else than castaways (Nos. 167, 169). In another case, "as the greater part of one side is flat . . . it is evidently done for the purpose of being held in the hand" (p. 86). Again, "the object of making such an instrument is clear," namely, "for insertion in a club" (pp. 94, 95). "There can be no doubt that . . . they have been, or were intended to be, inserted into sockets" (p. 109). No. 159, in which "we have a shaft-smoother, borer and knife included in one object" (p. 116), must have been the delight of some Palæolithic schoolboy! Where statements of opinion occur in such form as "*I* have no doubt," they are of course justifiable; but in this sceptical age it is risky to say "there can be no doubt." It is quite refreshing to hear that there are implements whose "use is almost beyond conjecture" (p. 98). Most likely differentiation in the use of tools did not go far in Palæolithic times.

In the illustrations it would seem that in some cases justice has hardly been done to the specimens, or we should not be told by so experienced a person as the author that No. 144 (Plate ii.) is "the finest example of Palæolithic work" that he has seen. There is, too, a deficiency that should be supplied in another edition: a map and a general section of the district would much help most readers; and these could well be given instead of some of the foreign objects, such as the eternal carved reindeer, &c., without which no anthropological work seems to be thought complete, and which, by frequent repetition, have grown to be nearly as irritating as the faces and figures ever obtruding themselves from the advertising columns of newspapers and magazines.

The frontispiece, by Mr. Worthington Smith, should be acceptable to the advocates of women's rights. The woman is represented as the skilled artist, whilst the man is the mere labourer!

OUR BOOK SHELF

Hand-book of Practical Botany for the Botanical Laboratory and Private Student. By Prof. E. Strasburger. Edited from the German by W. Hillhouse, M.A., F.L.S. (Swan Sonnenschein, Lowrey, and Co., 1887.)

PROF. STRASBURGER'S well-known work, "Das botanische Practicum," has already been reviewed in the pages of NATURE (vol. xxx. p. 214), so that a short notice may suffice for the present hand-book, which is essentially a translation of the *smaller* German edition. Only the account of the fall of the leaf (pp. 156-59) has been taken from the larger work.

The present edition has been fully revised by the author, and also contains a considerable number of editorial notes and additions. The latter are usually indicated by being inclosed in brackets. It would, perhaps, have been better if this had been done throughout, especially in the introduction. A number of additional figures have been inserted by the editor. These are almost all reproductions of familiar text-book illustrations. Many of them certainly come in well, but we cannot help feeling that the constant reappearance of old figures has become rather wearisome, and that in this instance it tends to take off from the freshness which was so pleasant a characteristic of Prof. Strasburger's "Practicum."

We much regret that no account of any of the seaweeds finds a place in this edition. The admirable description of Fucus in the larger treatise of the author might well have been introduced here, while we think that the editor would have been well advised to add an example of the red seaweeds on his own account, or at least to reproduce Prof. Strasburger's description of the fresh-water Batrachospermum. It is easy to see why the author, writing for German elementary students, omitted all reference to seaweeds in his smaller edition. In England we are in a very different position, and it is a pity that students should not at once be made acquainted with plants which are so instructive and so easily accessible.

As the editor explains in his preface that the translation was executed at a time of serious pressure, it would be unfair to enter into any detailed criticism. It must, however, be admitted that the signs of haste are very frequent, and that there is much need for revision in a future edition. There are one or two instances of this which cannot be quite passed over. At p. 11, "durchschnittlich," which means *on the average*, is translated "sectionally," while at p. 49 we have "carefully," where the author says "with advantage" ("mit Vortheil"). At p. 169, note 2, "perfection" should be "development," while on p. 208 the statement that "we *know* the angular outline of the crystals [in Spirogyra] even without reagents," has an odd effect. The word should of course be *recognise*. At p. 67 the use of the word "pits" for the deep depressions ("Grübchen") which lead down to the stomata in Aloe, &c., seems to us likely to confuse the beginner. The phrase "starch-builders" (p. 43, &c.) strikes us as awkward, and is certainly not accurate as a translation. The use of the term *laticiferous cells*, in speaking of Chelidonium, is unfortunate. The organs in question of course come under the head of laticiferous *vessels*.

In conclusion we may express a doubt whether the un-English form "fibro-vasal" has any advantages over the familiar word "fibro-vascular."

The appendices have been much expanded from the original indices of the author, and should be of great use to the student, to whom the book as a whole will be extremely welcome. D. H. S.

Elementary Practical Biology—Vegetable. By Thomas W. Shore, M.D., B.Sc. (London: Churchill, 1887.)

THIS book is welcome more as a sign of the ever-growing attention paid to plant-structure than for any peculiar merit it has as a guide to the subject. The author fairly expresses his indebtedness to such practical books as Bower and Vines's, and claims originality only for his arrangement and treatment of the subject. The arrangement is as follows:—First comes an introduction dealing with the necessary apparatus and the preparation, &c., of objects. This is very concisely and sensibly done. Part I. deals with general vegetable morphology, treating in due sequence of the cell, the tissues, the systems of tissues, the apices of stems and roots, and cell-multiplication or cell-reproduction. Part II. is devoted to the Cryptogamia, beginning with the Fungi and working up to the vascular forms. Part III. is confined to the Gymnosperms, and Part IV. to the Angiosperms. So much for the arrangement. There may be no guide to practical work covering precisely all these types in this way, but text-books are by no means wanting which contain this arrangement of matter. The originality here is therefore not at all striking—perhaps fortunately so. As for the treatment, the student is conducted through the course with a baldness in the directions to note this and observe that, which reminds one of the style of a personal conductor through an historic building. The book has a purely practical aim, with the excellent purpose of preventing "cram"; but a student who should undergo this course of instruction, noting and observing no more than he is here directed to do, would find himself, at the end of it, the dispirited possessor of a mass of information which would result in a sad fit of mental indigestion. A practical guide of this kind throws too much of the burden of instruction upon the lecturer whose course accompanies